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III. "Brief Description of a Ctenostomatous Polyzoon, allied to Vesicularia, occurring on the Australian Coast." By JOHN DENIS MACDONALD, Esq., Assistant Surgeon R.N. Communicated by Captain DENHAM, R.N., F.R.S. Received January 13, 1857.

In one of our visits to Moreton Bay, the sean was hauled at Moreton Island, and amongst the masses of sea-weed, &c. brought up with the net, I found numerous specimens of a very beautiful Polyzoon, a small portion of which I had previously dredged at Port Stevens from a depth of 5 or 6 fathoms.

The Polypidom may be said to have consisted mainly of rooted, spreading and plantlike portions, and short, straight creeping trunks, connected at both extremities with the fixed part of the former, so that the whole presented the appearance of an open lace-work, having all the transparency and lustre of glass.

The trunks and branches were nearly perfectly cylindrical, and composed of an outer membranous sheath distended with a clear fluid (which escaped with considerable force when the sheath was ruptured), and line-like reticulated vessels disposed in one plane, so as to communicate laterally with the polyp-cells, and divide the axis longitudinally into equal halves. The more central canals of this vascular plane combined to form a compound vessel, which opened into a spherical sinus with cellular parietes at the base of each branch.

The ramification of the Polypidom generally exhibited a trichotomous arrangement, with simple articulations occurring only where the branches were given off.

The cells were clustered in linear series on opposite sides of the branched axis, oval in shape, corneous in texture, with a terminal combed aperture, folding inwards by the contraction of four equidistant sets of muscular fibres, which imparted a quadrilateral figure to the opening.

The polypes were very minute, but exhibited distinctly all the important points of structure observable in those of *Vesicularia* and *Bowerbankia*, between which genera this polyzoon would appear to

lie. The ciliated tentacula, like those of *Vesicularia*, are eight in number, and do not possess the motionless hair-like processes which project from the back of each in *Bowerbankia*.

Although too much importance must not be attached to the actual number of tentacula surrounding the oral aperture, the tendency to multiply those organs must not be altogether forgotten. Thus, while there are but eight in *Vesicularia*, *Bowerbankia densa* and *Bowerbankia repens* possess respectively ten and twelve.

Both *Bowerbankia* and *Vesicularia* agree in the uniserial and unilateral distribution of the polypes, but in the present instance the cells are arranged in linear and bilateral clusters.

February 26, 1857.

The LORD WROTTESELEY, President, in the Chair.

The following communications were read :—

- I. "Observations on the Natural Affinities and Classification of Gasteropoda." By JOHN DENIS MACDONALD, Assistant Surgeon R.N. Communicated by Captain DENHAM, R.N., F.R.S. Received January 13, 1857.

(Abstract.)

During his sojourn among the Feejee Islands, the author devoted much time to the anatomical investigation of recent Gasteropoda, with the view of discovering such indications of affinity in the details of structure as might serve as a basis for a natural arrangement of the order; and the present paper is designed to give a statement of some of the results of his researches, in order that the affinities of structure developed may be fairly examined and taken for what they are worth as principles of classification.

After pointing out objections to the foundation of primary divisions among the Gasteropoda on characters derived from the shell or from modifications of the respiratory organs, the author observes in respect of the value of sexual characters, that when the distinguishing features of a class are once satisfactorily determined, and this contains